

### **DETAILED ACTION**

#### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(c), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(c) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/20/2010 has been entered.

#### ***Claim Objections***

2. Claims 8, 37, and 59 are objected to because of the following informalities: Claims 8, 37, and 59 recite subject matter in parentheses, which makes it appear that recited subject matter is optional. It is suggested that the parentheses in the claims be removed to avoid confusion. Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 8-9, 37, 51 are rejected under 35 U.S.C. 102(b) as being anticipated by Miyake et al (US 4,341,685) as evidenced by Odian (see pages of *Principles of Polymerization*, attached to previous Office Action), the *STN Search Report* (see attached pages) and Squire (US 4,935,477).

Regarding claim 8, Miyake et al discloses

- a. fluoropolymer dispersion which comprises a fluoropolymer solid composition dispersed in a liquid medium (Abstract, Column 2, Lines 6-15) and Lines 30-55),
- b. said fluoropolymer solid composition containing a fine particle comprising a fluoropolymer (Column 2, Lines 38-65 disclose the fluoropolymer latex, i.e. a dispersion of polymeric particles in an aqueous medium).
- c. said fluoropolymer having an acid/acid salt group, said acid/acid salt group being a carboxyl group,  $\text{SO}_3\text{M}$ , where  $\text{M}^1$  is a metal whose valence is L and said metal whose valence is L is a metal belonging to the group 1 of the Periodic Table (Column 3, Lines 150-40 disclose acid type functional monomer having the end group  $\text{SO}_3\text{M}$  where M is an alkali metal atom, i.e. belong to the first group of the Periodic Table),
- d. said fine particle comprising the fluoropolymer containing, at the proportion of at least 25% by mass thereof, a spherical fluoropolymer fine particle –

It is noted that the reference does not explicitly disclose that the particles are substantially spherical. However, it is the Examiner's position that the particle disclosed by the reference intrinsically meet this limitation for the following reasons. Firstly, it is noted that the reference discloses that (a) the polymer is a latex, i.e. formed by emulsion polymerization, e.g., see Column 2 Lines 38-43. As evidenced by the Examples is the reference, e.g. Example 1 disclosed

in Column 8, the polymerization of the monomers occurs utilizing the compound  $C_8F_{17}COONH_4$  which as evidenced by the *STN Search Report* and Col. 7 Lines 50-56 of Squire, this compound is known in the art as ammonium perfluoronate which is a surfactant, see Col. 7 Lines 50-56 of Squire. Thus, it is clear that the fluoropolymer dispersion formed by Miyake et al occurs by the process of emulsion polymerization. As evidenced Further, as evidenced by Page 341 of Odian emulsion polymerization yields spherical particles.

e. said spherical fluoropolymer fine particle being substantially spherical, wherein the spherical fluoropolymer fine particle has an average particle diameter of 10 to 300 nm.

While Miyake et al does not explicitly disclose that the fluoropolymer particles have a particle diameter of 10 to 300 nm, it is the Examiner's position, absent evidence to the contrary that the fluoropolymer particles disclosed by Miyake et al inherently meet this limitation. Evidence supporting the Examiner's position is found on Page 341 of Odian which discloses that emulsion polymerization yields particle sizes of 50 to 200 nm. As discussed above, the process disclosed by Miyake et al occurs via emulsion polymerization and given the evidence in Odian that such polymerization yields spherical polymer particle sizes of 50 to 200 nm, within the range presently claimed, it is the Examiner's position that the particles of Odian meet the limitation of particle size recited in the present claims.

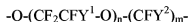
Regarding claim 9, Miyake et al as evidenced by Odian, *STN Search Report*, and Squire teaches all the claim limitations as set forth above. Additionally, Miyake et al discloses the fluoropolymer solid composition amounts to 2 to 80% by mass based on the total mass of the

fluoropolymer dispersion (Column 7 Lines 45-49 5 to 50 wt%, which is within the range presently recited)

Regarding claim 38, Miyake et al as evidenced by Odian, *STN Search Report*, and Squire teaches all the claim limitations as set forth above. Additionally, Miyake et al discloses a dispersion composition for thin film formation (Column 7 Lines 50-55) which comprises the fluoropolymer dispersion and at least one alcohol selected from the group consisting of methanol and propanol (Column 7, Lines 33-37 alcohols, Column 8, Lines 50-55 – methanol, , Column 9, Lines 62-65 - propanol).

Regarding claim 51, Miyake et al as evidenced by Odian, *STN Search Report*, and Squire teaches all the claim limitations as set forth above. Regarding the limitation that the fluoropolymer dispersion wherein the fine particle comprising the fluoropolymer contains the spherical fluoropolymer fine particle at the proportion of at least 50% by mass thereof, it is noted as discussed as, Miyake et al as evidenced by Odian and Squire discloses formation of the fluoropolymer dispersion by emulsion polymerization. Further, as discussed above, as evidence by Odian , emulsion polymerization results in spherical particles, Thus, given that Miyake et al discloses a process of emulsion polymerization and the evidence disclosed in Odian drawn to the formation of spherical particles by emulsion polymerization, it is the Examiner's position that the fluoropolymer particles disclosed by Bekiarian inherently will be at least 50 % by mass spherical.

Regarding claim 56, Miyake et al as evidenced by Odian, *STN Search Report* ,and Squire teaches all the claim limitations as set forth above. Additionally, Miyake et al discloses that the acid/acid salt group is bound to a fluoroether side chain represented by the following general Formula (I):



in which

- a.  $\text{Y}^1$  represents a fluorine atom, a chlorine atom or a perfluoroalkyl group;
- b.  $n$  represents an integer of 0 to 3, and  $n$  atoms/groups of  $\text{Y}^1$  may be the same or different;
- c.  $\text{Y}^2$  represents a fluorine atom or a chlorine atom;
- d.  $m$  represents an integer of 1 to 5, and  $m$  atoms of  $\text{Y}^2$  may be the same or different.
- e. said fluoroether side chain being bound, in the manner of ether bonding, to a carbon atom constituting a perfluoroethylene unit in a main chain of the fluoropolymer (Column 3 Lines 15-40 disclose  $\text{CF}_2=\text{CX}-(\text{CFX}')_p-(\text{OCF}_2\text{CFY})_l(\text{O})_m(\text{CFY}')_m\text{A}$  where A is a acid groups,  $\text{X}' = \text{X} = \text{F}$ ,  $l = 1$ ,  $m = 1$  and  $n = 2$ , the above chain is bound  $\text{CF}_2=\text{CX}-(\text{CFX}')$  via an ether bond)

Regarding claim 37, Miyake et al discloses,

- a. a fluoropolymer dispersion in which a fine particle comprising a fluoropolymer is dispersed in an aqueous dispersion medium (Column 2, Lines 38-65 – disclose polymer latex, i.e. a dispersion of polymeric particles in a liquid medium),
- b. said fluoropolymer having a sulfonic acid group and/or carboxyl group Column 3, Lines 15040 disclose acid type functional monomer having the end group  $\text{SO}_3\text{M}$  where M is an alkali metal atom, i.e. belong to the first group of the Periodic Table)

c. said fluoropolymer precursor obtained by emulsion polymerization (It is noted that the reference discloses that (a) the polymer is a latex, i.e. formed by emulsion polymerization, e.g., see Column 2 Lines 3-8-43. As evidenced by the Examples is the reference, e.g. Example 1 disclosed in Column 8, the polymerization of the monomers occurs utilizing the compound  $C_8F_{17}COONH_4$  which as evidenced by the *STN Search Report* and Col. 7 Lines 50-56 of Squire, this compound is known in the art as ammonium perfluorononate which is a surfactant, see Col. 7 Lines 50-56 of Squire. Thus, it is clear that the fluoropolymer dispersion formed by Miyake et al occurs by the process of emulsion polymerization).

d. said fluoropolymer fluoropolymer, wherein the fine particle has an average particle diameter of 10 to 300 nm

While Miyake et al does not explicitly disclose that the fluoropolymer particles have a particle diameter of 10 to 300 nm, it is the Examiner's position, absent evidence to the contrary that the fluoropolymer particles disclosed by Miyake et al inherently meet this limitation. Evidence supporting the Examiner's position is found on Page 341 of Odian which discloses that emulsion polymerization yields particle sizes of 50 to 200 nm. As discussed above, the process disclosed by Miyake et al occurs via emulsion polymerization and given the evidence in Odian that such polymerization yields spherical polymer particle sizes of 50 to 200 nm, within the range presently claimed, it is the Examiner's position that the particles of Odian meet the limitation of particle size recited in the present claims.

e. said fluoropolymer dispersion prepared by hydrolyzing, in an aqueous medium -  $SO_2X^1$ ,  $X^1$  a halogen atom and/or  $COZ^1$  where  $Z^1$  represents an alkoxyl group having 1 to 4

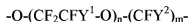
carbon atoms representing a halogen atom which a fluoropolymer precursor has thereby to give the fluoropolymer

f. said fluoropolymer dispersion being produce without drying said fluoropolymer precursor and said fluoropolymer,

Regarding the claim limitations recited (items e and f recited above) in the present claims that said fluoropolymer dispersion prepared by hydrolyzing, in an aqueous medium  $\text{-SO}_2\text{X}^1$ ,  $\text{X}^1$  a halogen atom and/or  $\text{COZ}^1$  where  $\text{Z}^1$  represents an alkoxyl group having 1 to 4 carbon atoms representing a halogen atom which a fluoropolymer precursor has thereby to give the fluoropolymer, although Bekiarian does not disclose the presently claimed process, it is noted that “[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process”, *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) . Further, “although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product”, *In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir.1983). See MPEP 2113.

Therefore, absent evidence of criticality regarding the presently claimed process and given that Miyake et al meets the requirements of the claimed composition, Miyake et al clearly meet the requirements of present claims.

Regarding claim 57, Miyake et al as evidenced by Odian, *STN Search Report* and Squire teaches all the claim limitations as set forth above. Additionally, Miyake et al discloses the fluoropolymer dispersion wherein the sulfonic acid group is bound to a fluoroether side chain represented by the following general Formula (I):



in which

- a.  $\text{Y}^1$  represents a fluorine atom, chlorine atom or a perfluoroalkyl group;
- b.  $n$  represents an integer of 0 to 3;
- c.  $\text{Y}^2$  represents a fluorine atom or a chlorine atom;
- d.  $m$  represents an integer of 1 to 5, and  $m$  atoms of  $\text{Y}^1$  may be the same or different,
- e. and wherein said fluoroether side chain is bound, in the manner of ether bonding, to a carbon atom constituting a perfluoroethylene unit in a main chain of the

fluoropolymer (Column 3 Lines 15-40 disclose  $\text{CF}_2=\text{CX}-(\text{CFX}')_p-(\text{OCF}_2\text{CFY})_l(\text{O})_m(\text{CFY}')_n\text{A}$  where A is a acid groups,  $\text{X}' = \text{X} = \text{F}$ ,  $l = 1$ ,  $m = 1$  and  $n = 2$ , the above chain is bound  $\text{CF}_2=\text{CX}-(\text{CFX}')$  via an ether bond)

In light of the above, it is clear that Miyake et al as evidenced by Odian, *STN Search Report* and Squire anticipates the presently recited claims.

5. Claims 8, 37-38, 51, 55-58 are rejected under 35 U.S.C. 102(e) as being anticipated by Bekiarian et al (US 2004/0167289) as evidenced by Odian (see pages of *Principles of Polymerization*, attached to previous Office Action) and Kaulbach et al (US 2004/0072977).

Regarding claim 8, Bekiarian et al discloses



a. fluoropolymer dispersion (Page 4 [0049] copolymer of PSEPVE/VF2 dispersed in a mixture of MeOH - methanol and water) which comprises a fluoropolymer solid composition dispersed in a liquid medium (Page 4 [0049] copolymer of PSEPVE/VF2 granules dispersed in a mixture of MeOH - methanol and water),

b. said fluoropolymer solid composition containing a fine particle comprising a fluoropolymer (Page 4 [0049] - the fluoropolymer dispersion is that of the solid copolymer of PSEPVE/VF2 granules prepared by polymerization in [0048]).

c. said fluoropolymer having an acid/acid salt group, said acid/acid salt group being  $-\text{SO}_3\text{NR}^1\text{R}^2\text{R}^3\text{R}^4$ , where  $\text{R}^1$ ,  $\text{R}^2$ ,  $\text{R}^3$  and  $\text{R}^4$  are the same or different and each represents a hydrogen atom (Page 5 [0031] discloses perfluoroalkenyl monomer having a pendent group having the group  $\text{SO}_3\text{-NH}_4^+$ , where  $\text{R}^1 = \text{R}^2 = \text{R}^3 = \text{R}^4 = \text{H}$  this is obtained by the use of ammonium carbonate solution Page 5 [0033] and exemplified is the process of Example 1 Page 5 [0049]),

d. said fine particle comprising the fluoropolymer containing, at the proportion of at least 25% by mass thereof, a spherical fluoropolymer fine particle –

It is noted that the reference does not explicitly disclose that the particles are substantially spherical. However, it is the Examiner's position that the particle disclosed by the reference intrinsically meet this limitation for the following reasons. Firstly, it is noted that the reference discloses a polymerization process of VF2 and PSEPVE utilizing ammonium perfluorooctanoate. As evidenced by Page 3 [0024]-[0026] of Kaulbach et al which discloses fluorinated surfactants such as ammonium salts of perfluorooctanoic acid that are utilized as surfactants in aqueous emulsion polymerization processes. That is, the polymerization process

disclosed by Bekiarian occurs by emulsion polymerization. Further, as evidenced by Page 341 of Odian emulsion polymerization yields spherical particles.

e. said spherical fluoropolymer fine particle being substantially spherical, wherein the spherical fluoropolymer fine particle has an average particle diameter of 10 to 300 nm.

While Bekiarian does not explicitly disclose that the fluoropolymer particles have a particle diameter of 10 to 300 nm, it is the Examiner's position, absent evidence to the contrary that the fluoropolymer particles disclosed by Bekiarian inherently meet this limitation. Evidence supporting the Examiner's position is found on Page 341 of Odian which discloses that emulsion polymerization yields particle sizes of 50 to 200 nm. As discussed above, the process disclosed by Bekiarian occurs via emulsion polymerization and given the evidence in Odian that such polymerization yields spherical polymer particle sizes of 50 to 200 nm, within the range presently claimed, it is the Examiner's position that the particles of Odian meet the limitation of particle size recited in the present claims.

Regarding claim 38, Bekiarian as evidenced by Odian and Kaulbach teaches all the claim limitations as set forth above. Additionally, Bekiarian discloses a dispersion composition for thin film formation (Page 2 [0025]) which comprises the fluoropolymer dispersion and at least one alcohol selected from the group consisting of methanol (Page 4 [0049] - discloses MeOH or methanol).

Regarding claim 51, Bekiarian as evidenced by Odian and Kaulbach teaches all the claim limitations as set forth above. Regarding the limitation that the fluoropolymer dispersion wherein

the fine particle comprising the fluoropolymer contains the spherical fluoropolymer fine particle at the proportion of at least 50% by mass thereof, it is noted as discussed as, Bekiarian as evidenced by Odian and Kaulbach discloses formation of the fluoropolymer dispersion by emulsion polymerization. Further, as discussed above, as evidence by Odian, emulsion polymerization results in spherical particles. Thus, given that Bekiarian discloses a process of emulsion polymerization and the evidence disclosed in Odian drawn to the formation of spherical particles by emulsion polymerization, it is the Examiner's position that the fluoropolymer particles disclosed by Bekiarian inherently will be at least 50 % by mass spherical.

Regarding claim 55, Bekiarian as evidenced by Odian and Kaulbach teaches all the claim limitations as set forth above. Further, given the hydrolysis process disclosed by Bekiarian, i.e. hydrolysis of the polymer particle disclosed on Page 4 [0049] via ammonium carbonate, would result in acid/salt groups being formed on the surface of the particles, thus inherently meeting the limitations that existence of the acid/acid salt groups on a particle surface of the fine particles comprising fluoropolymer is more than that in the particle inside thereof.

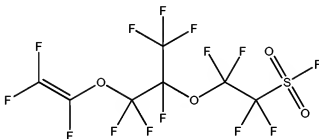
Regarding claim 37, Bekiarian et al discloses

a. a fluoropolymer dispersion in which a fine particle comprising a fluoropolymer is dispersed in an aqueous dispersion medium (Page 4 [0049] copolymer of PSEPVE/VF2 dispersed in a mixture of MeOH - methanol and water) which comprises a fluoropolymer solid

composition dispersed in a liquid medium (Page 4 [0049] copolymer of PSEPVE/VF2 granules dispersed in a mixture of MeOH - methanol and water),

b. said fluoropolymer having a sulfonic acid group and/or carboxyl group, said fluoropolymer dispersion prepared by hydrolyzing, in an aqueous medium (Page 4 [0049] - the fluoropolymer dispersion is that of the solid copolymer of PSEPVE/VF2 granules prepared by polymerization in [0048], hydrolysis occurs via ammonia carbonate, see Page 4 [0049] and Page 2 [0031]-[0033])

c.  $-\text{SO}_2\text{X}^1$ ,  $\text{X}^1$  representing a halogen atom which a fluoropolymer precursor has thereby to give the fluoropolymer (Page 4, Page [0048] discloses PSEPVE or 2-[1-[difluoro[(trifluoroethenyl)oxy]methyl]-1,2,2,2-tetrafluoroethoxy]-1,1,2,2-tetrafluoroethanesulfonyl fluoride which has the following structure:



which clearly contains the group  $-\text{SO}_2\text{X}^1$  and  $\text{X}^1$  is the halogen, F.)

d. said fluoropolymer precursor obtained by emulsion polymerization (Page 3 [0046]-[0047] and Page 4 [0048] disclose polymerization utilizing VF2, PSEPVE, water, the polymerization initiator potassium persulfate, and the compound ammonium perfluorooctanoate which as evidenced by Page 3 [0024]-[0026] of Kaulbach et al - fluorinated surfactants such as ammonium salts of perfluorooctanoic acid that are utilized as surfactants in aqueous emulsion polymerization processes).

c. said fluoropolymer, wherein the fine particle has an average particle diameter of 10 to 300 nm

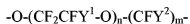
While Bekiarian does not explicitly disclose that the fluoropolymer particles have a particle diameter of 10 to 300 nm, it is the Examiner's position, absent evidence to the contrary that the fluoropolymer particles disclosed by Bekiarian inherently meet this limitation. Evidence supporting the Examiner's position is found on Page 341 of Odian which discloses that emulsion polymerization yields particle sizes of 50 to 200 nm. As discussed above, the process disclosed by Bekiarian occurs via emulsion polymerization and given the evidence in Odian that such polymerization yields spherical polymer particle sizes of 50 to 200 nm, within the range presently claimed, it is the Examiner's position that the particles of Odian meet the limitation of particle size recited in the present claims.

Regarding the claim limitation recited in the present claims that said fluoropolymer dispersion being produced without drying said fluoropolymer precursor, Although Bekiarian does not disclose the presently claimed process, it is noted that "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process", *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) . Further, "although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the

prior art product", *In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir.1983). See MPEP 2113.

Therefore, absent evidence of criticality regarding the presently claimed process and given that Bekiarian meets the requirements of the claimed composition, Bekiarian clearly meet the requirements of present claims.

Regarding claim 56, Bekiarian as evidenced by Odian and Kaulbach teaches all the claim limitations as set forth above. Additionally, Bekiarian discloses that the acid/acid salt group is bound to a fluoroether side chain represented by the following general Formula (I):



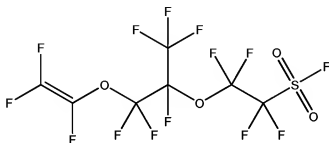
in which

- a.  $\text{Y}^1$  represents a fluorine atom, a chlorine atom or a perfluoroalkyl group;
- b.  $n$  represents an integer of 0 to 3, and  $n$  atoms/groups of  $\text{Y}^1$  may be the same or different;
- c.  $\text{Y}^2$  represents a fluorine atom or a chlorine atom;
- d.  $m$  represents an integer of 1 to 5, and  $m$  atoms of  $\text{Y}^2$  may be the same or different.
- e. said fluoroether side chain being bound, in the manner of ether bonding, to a carbon atom constituting a perfluoroethylene unit in a main chain of the fluoropolymer (Page 2 [0030]-[0032] discloses pendent group, i.e. side chain, in Formula (I) of the reference, the side chain is bound to the carbon atom via ether bonding).

Regarding item (a) -(d), the reference discloses PSEPVE or 2-[1-[difluoro[(trifluoroethenyl)oxy]methyl]-1,2,2,2-tetrafluoroethoxy]-1,1,2,2-

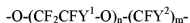
Art Unit: 1725

tetrafluoroethanesulfonyl fluoride (Page 3 [0042] and Page 4, Page [0048]) has the following structure:



from which it is clear that  $Y^1$  is a perfluoroalkyl group,  $n$  is 1,  $Y^2$  is a fluorine atom, and  $m$  is 2, and where  $SO_2F$  forms the hydrolyzed acid salt group  $SO_3NH_4$

Regarding claim 57, Bekirian as evidenced by Odian and Kaulbach teaches all the claim limitations as set forth above. Additionally, Bekirian discloses the fluoropolymer dispersion wherein the sulfonic acid group is bound to a fluoroether side chain represented by the following general Formula (I):



in which

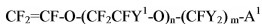
- $Y^1$  represents a fluorine atom, chlorine atom or a perfluoroalkyl group;
- $n$  represents an integer of 0 to 3;
- $Y^2$  represents a fluorine atom or a chlorine atom;
- $m$  represents an integer of 1 to 5, and  $m$  atoms of  $Y^1$  may be the same or different,
- and wherein said fluoroether side chain is bound, in the manner of ether bonding, to a carbon atom constituting a perfluoroethylene unit in a main chain of the fluoropolymer

Regarding item (a) -(d), the reference discloses PSEPVE or 2-[1-[difluoro[(trifluoroethenyl)oxy]methyl]-1,2,2,2-tetrafluoroethoxy]-1,1,2,2-tetrafluoroethanesulfonyl fluoride (Page 3 [0042] and Page 4, Page [0048]) has the following structure:



from which it is clear that Y<sup>1</sup> is a perfluoroalkyl group, n is 1, Y<sup>2</sup> is a fluorine atom, and m is 2, and were SO<sub>2</sub>F forms the hydrolyzed acid salt group SO<sub>3</sub>NH<sub>4</sub>. With respect to item (e), Page 2 [0030]-[0032] discloses pendent group, i.e. side chain, In Formula (I) of the reference, the side chain is bound to the carbon atom via ether bonding, further, it is noted that during polymerization, the ethylenically unsaturated bond in PSEPVE polymerizes during polymerization with VF<sub>2</sub>, 1,1-difluoroethene, a perfluoroethene unit which comprises the main of the fluoropolymer).

Regarding claim 58, Bekiarian as evidenced by Odian and Kaulbach teaches all the claim limitations as set forth above. Additionally, Bekiarian discloses wherein the fluoropolymer precursor is one obtained by polymerizing a fluorovinyl ether derivative represented by the following general formula (II):

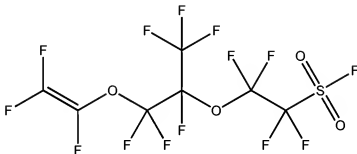


wherein



- a.  $Y^1$  represents a perfluoroalkyl group;
- b. n represents an integer of 0 to 3,
- c.  $Y^2$  represents a fluorine atom or a chlorine atom;
- d. m represents an integer of 1 to 5;
- e.  $A^1$  represents  $-SO_2X$
- f. X represents a halogen atom.

Regarding item (a) -(f), the reference discloses PSEPVE or 2-[1-(difluoro[(trifluoroethenyl)oxy]methyl)-1,2,2,2-tetrafluoroethoxy]-1,1,2,2-tetrafluoroethanesulfonyl fluoride which is identical to that presently claimed (Page 3 [0042] and Page 4, Page [0048]) has the following structure:



from which it is clear that  $Y^1$  is a perfluoroalkyl group, n is 1,  $Y^2$  is a fluorine atom, and m is 2, and  $A^1$  is  $SO_2F$  where X (f above) is fluorine.

In light of the above, it is clear that Bekiarian as evidenced by Odian and Kaulbach anticipates the presently recited claims.

6. Claims 9-10 are rejected under 35 U.S.C. 102(e) as being anticipated by Bekiarian et al (US 2004/0167289) as evidenced by Odian (see pages of *Principles of Polymerization*, attached

to previous Office Action), Kaulbach et al (US 2004/0072977) and *The Merck Index* (see attached Pages)

The discussion with respect to Bekiarian et al, Odian, and Kaulbach et al as set forth in Paragraph 5 above is incorporated here by reference.

Regarding claim 9, Bekiarian as evidenced by Odian and Kaulbach teaches all the claim limitations as set forth above. Additionally, Bekiarian discloses that the fluoropolymer solid composition amounts to 2 to 80% by mass based on the total mass of the fluoropolymer dispersion (Page 4 [0049] – 9.7 % wt %). This determination is made based on the disclosure on Page 4 [0049] where the dispersion contains 10 g of PSEPVE/VF2 polymer, 3.85 g of ammonium carbonate, and 100 ml of MeOH/H<sub>2</sub>O (50 volume % MeOH). Given the density of methanol at 25 °C disclosed in *The Merck Index* on Page 6019 – Item 6024 of 0.7866 g/cm<sup>3</sup> and 50 % volume disclosed in Bekiarian, the amount of methanol on a mass basis in Barbarian is determined to be 39.33 g. Thus, the total dispersion comprises 10 g of PSEPVE/VF2 polymer, 3.85 g of ammonium carbonate, 50 g water and 39.33 g MeOH, or 103.18 g total or 9.7 wt % polymer. Thus, it is noted that the amount of polymer disclosed by the reference is within the range of 2 to 80 wt % as presently claimed.

Regarding claim 10, Bekiarian as evidenced by Odian and Kaulbach teaches all the claim limitations as set forth above. Additionally, Bekiarian discloses that the liquid medium is an aqueous dispersion medium, said aqueous dispersion medium having a water content of 10 to 100% by mass (Page 4 [0049] – 55.9 % wt %). This determination is made based on the disclosure on Page 4 [0049] where the dispersion contains 10 g of PSEPVE/VF2 polymer, 3.85 g

of ammonium carbonate, and 100 ml of MeOH/H<sub>2</sub>O (50 volume % MeOH). Given the density of methanol at 25 °C disclosed in *The Merck Index* on Page 6019 – Item 6024 of 0.7866 g/cm<sup>3</sup> and 50 % volume disclosed in Bekiarian, the amount of methanol on a mass basis in Barbarian is determined to be 39.33 g. Thus, the total liquid medium of the dispersion 50 g water and 39.33 g MeOH, or 89.33 g total or 55.9 wt %. Thus, it is noted that the amount of water disclosed by the reference is within the range of 10 to 100 wt % as presently claimed.

In light of the above, it is clear that Barbarian as evidenced by Odian, Kaulbach, and *The Merck Index* anticipates the presently recited claims.

7. Claim 59 is rejected under 35 U.S.C. 102(e) as being anticipated by Bekiarian et al (US 2004/0167289) as evidenced by Odian (see pages of *Principles of Polymerization*, attached to previous Office Action), Kaulbach et al (US 2004/0072977) and *The STN Search Report* (see attached pages).

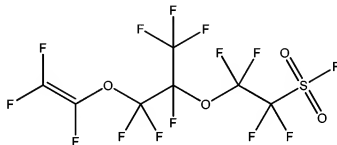
The discussion with respect to Bekiarian et al, Odian, and Kaulbach et al as set forth in Paragraph 5 above is incorporated here by reference.

Regarding claim 58, Bekiarian as evidenced by Odian and Kaulbach teaches all the claim limitations as set forth above. Additionally, the reference discloses that the fluoropolymer precursor is one obtained by

a. polymerizing a fluoromonomer (Pm) fluorine-containing emulsifier (Page 3 [0046]-[0047] disclose polymerization of PSEPVE, the fluoromonomer in the presence of ammonium perfluorooctanoate)

b. said fluoromonomer (Pm) having  $-\text{SO}_2\text{X}^1$  ( $\text{X}^1$  representing a halogen atom)

the reference discloses PSEPVE or 2-[1-[difluoro[(trifluoroethenyl)oxy]methyl]-1,2,2,2-tetrafluoroethoxy]-1,1,2,2-tetrafluoroethanesulfonyl fluoride which is identical to that presently claimed (Page 3 [0042] and Page 4, Page [0048]) has the following structure:



where  $\text{SO}_2\text{X}$  recited in the present claim is fluorine.

c. said fluorine-containing emulsifier being a fluorine-containing carboxylic acid represented by  $\text{X}^4(\text{CF}_2)_s\text{COOH}$  where  $\text{X}^4$  represents a fluorine atom and  $s$  representing an integer of 6 to 20) or a salt thereof (the reference discloses ammonium perfluorooctanoate, which as evidenced by Kaulbach et al is an emulsifier. Further, it is noted that as evidenced by the *STN Search Report*, ammonium perfluorooctanoate has the following structure:



which is a salt compound where  $\text{X}^4$  is an F atom, and  $s$  is 7. It is noted that ammonium perfluorooctanoate disclosed by Bekirian is identical to that presently claimed.

In light of the above, it is clear that Bekirian as evidenced by Odian, Kaulbach, and *The STN Search Report* anticipates the presently recited claims.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claim 54 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyake et al (US 4,341,685) in view of Odian (see pages of *Principles of Polymerization*, attached to previous Office Action), the *STN Search Report* (see attached pages) and Squire (US 4,935,477).

The discussion with respect to Miyake et al, Odian, the *STN Search Report*, and Squire as set forth in Paragraph 5 above is incorporated here by reference

Regarding claim 54, the combined disclosures of Miyake et al, Odian, the *STN Search Report*, and Squire teach all the claim limitations as set forth above. As discussed above, Odian discloses that emulsion polymerization yields particle sizes of 50 to 200 nm which overlaps the recited diameters of 50 to 200 nm.

It is well settled that where the prior art describes the components of a claimed compound or compositions in concentrations within or overlapping the claimed concentrations a prima facie case of obviousness is established. See *In re Harris*, 409 F.3d 1339, 1343, 74 USPQ2d 1951, 1953 (Fed. Cir 2005); *In re Peterson*, 315 F.3d 1325, 1329, 65 USPQ 2d 1379, 1382 (Fed. Cir. 1997); *In re Woodruff*, 919 F.2d 1575, 1578 16 USPQ2d 1934, 1936-37 (CCPA 1990); *In re Malagari*, 499 F.2d 1297, 1303, 182 USPQ 549, 553 (CCPA 1974).

12. Claim 54 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bekiarian et al (US 2004/0167289) in view of Odian (see pages of *Principles of Polymerization*, attached to previous Office Action) and Kaulbach et al (US 2004/0072977)

The discussion with respect to Bekiarian et al, Odian, and Kaulbach et al as set forth in Paragraph 3 above is incorporated here by reference

Regarding claim 54, the combined disclosures of Bekiarian et al, Odian and Kaulbach et al teach all the claim limitations as set forth above. As discussed above, Odian discloses that emulsion polymerization yields particle sizes of 50 to 200 nm which overlaps the recited diameters of 50 to 200 nm.

It is well settled that where the prior art describes the components of a claimed compound or compositions in concentrations within or overlapping the claimed concentrations a prima facie case of obviousness is established. See *In re Harris*, 409 F.3d 1339, 1343, 74 USPQ2d 1951, 1953 (Fed. Cir 2005); *In re Peterson*, 315 F.3d 1325, 1329, 65 USPQ 2d 1379, 1382 (Fed. Cir. 1997); *In re Woodruff*, 919 F.2d 1575, 1578 16 USPQ2d 1934, 1936-37 (CCPA 1990); *In re Malagari*, 499 F.2d 1297, 1303, 182 USPQ 549, 553 (CCPA 1974).

### ***Double Patenting***

13. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

14. Claims 8, 37-38, 51, 54, and 56-58 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 11, 13, and 16 of copending Application No. 10/547,770.

Claims 1, 11, 13, and 16 of copending Application No. 10/547,770 recite a liquid composition comprising a fluoropolymer, and an aqueous dispersion medium where the fluoropolymer comprises acid/salt groups, i.e. carboxyl groups,  $-\text{SO}_2\text{X}$  or  $-\text{COOZ}$ , where X is  $\text{ONR}^1\text{R}^2\text{R}^3\text{R}^4$ , and  $\text{R}^1\text{-R}^4$  and Z are hydrogen. The particles are substantially spherical and are at least 25 % by mass of the fluoropolymer fine particles. It is noted that the amount of spherical particles recited in claim 1 of copending Application No. 10/547,770 is identical to that presently claimed. Claim 1 of copending Application No. 10/547,770 recites a side chain identical to that recited in claims 56 and 57. Claim 13 of copending Application No. 10/547,770 discloses that the fine particles have an average diameter of not smaller than 10 nm which overlaps the range of 10 to 300 nm presently claims in instant claims 8, 37, and 54. Further more claim 11 recites a process and formula identical to that recited in instant claim 58.

While claim 16 of copending Application No. 10/547,770 recites that the composition comprises a lower alcohol and does not claim alcohols such as methanol, propanol as recited in instant claim 38, note that Page 15, Lines 11-20 of copending Application No. 10/547,770 discloses that the terms lower alcohol is a monoalcohol containing not more than 5 carbon atoms which encompasses the alcohols recited in instant claim 8. Case law holds that those portions of the specification which provide support for the patent claims may also be examined and considered when addressing the issue of whether a claim in an application defines an obvious



variation of an invention claimed in the patent. In re Vogel, 422 F.2d 438, 164 USPQ 619,622 (CCPA 1970).

Regarding the particle size recited in claim 13 of copending Application No. 10/547,770, it is noted that it is well settled that where the prior art describes the components of a claimed compound or compositions in concentrations within or overlapping the claimed concentrations a prima facie case of obviousness is established. See In re Harris, 409 F.3d 1339, 1343, 74 USPQ2d 1951, 1953 (Fed. Cir 2005); In re Peterson, 315 F.3d 1325, 1329, 65 USPQ 2d 1379, 1382 (Fed. Cir. 1997); In re Woodruff, 919 F.2d 1575, 1578 16 USPQ2d 1934, 1936-37 (CCPA 1990); In re Malagari, 499 F.2d 1297, 1303, 182 USPQ 549, 553 (CCPA 1974).

15. Claims 8, 37-38, 51, 54, and 56-58 directed to an invention not patentably distinct from claims 1, 11, 13, and 16 of commonly assigned application 10/547,770. Specifically, see the discussed set forth above in Paragraph 14.

The U.S. Patent and Trademark Office normally will not institute an interference between applications or a patent and an application of common ownership (see MPEP Chapter 2300). Commonly assigned application, discussed above, would form the basis for a rejection of the noted claims under 35 U.S.C. 103(a) if the commonly assigned case qualifies as prior art under 35 U.S.C. 102(e), (f) or (g) and the conflicting inventions were not commonly owned at the time the invention in this application was made. In order for the examiner to resolve this issue, the assignee can, under 35 U.S.C. 103(c) and 37 CFR 1.78(c), either show that the conflicting inventions were commonly owned at the time the invention in this application was made, or name the prior inventor of the conflicting subject matter.

A showing that the inventions were commonly owned at the time the invention in this application was made will preclude a rejection under 35 U.S.C. 103(a) based upon the commonly assigned case as a reference under 35 U.S.C. 102(f) or (g), or 35 U.S.C. 102(e) for applications pending on or after December 10, 2004.

This is a provisional obviousness-type double patenting rejection.

***Response to Arguments***

16. Applicant's arguments filed 8/20/2010 have been fully considered but they are not persuasive.

17. Applicant's arguments regarding Doyle have been considered but are moot in light of the new rejection of the claims over Bekiarian et al set forth above.

18. Applicants argue that Bekiarian does not teach spherical polymer particles. Further Applicants argue that emulsion polymerization does not produce spherical fluoropolymer particles. As evidence of their position Applicants compare Example 5 of the present invention to Example 1B of US Patent 7,482,415 in the Declaration under 37 C.F.R. 1.132 filed on 8/21/2009. However, it is significant to note that in the previous Office Action, US 7,482,415 was not utilized to reject the present claims. Instead, Bekiarian in combination with Kaulbach et al and Odian was utilized against the present claims. While Example 1B of US '415 does not produce spherical fluoropolymer particles, the Declaration does not disclose fluoropolymer

particles produced by the closest prior art of record. US '415 discloses polymerization steps which are not disclosed in the polymerization process disclosed by Bekiarian et al. Significant differences in fluoropolymer polymerization processes disclosed by US '415 and Bekiarian et al include the use of the fluorosurfactant ammonium perfluorooctanoate in the Bekiarian reference. The compound, ammonium perfluorooctanoate, is a surfactant utilized in emulsion polymerization. Evidence supporting the Examiner's position is found on Page 3 [0024]-[0026] of Kaulbach et al (US 2004/0072977) which discloses fluorinated surfactants such as ammonium salts of perfluorooctanoic acid that are utilized as surfactants in aqueous emulsion polymerization processes. Further, as evidenced by Odian, emulsion polymerization results in spherical polymer particles. Thus, given the evidence in Kaulbach and Odian, and given that Bekiarian discloses a process of polymerizing PSEPVE and VF2 utilizing water and fluorosurfactant, the Examiner's position remains that the process disclosed by Bekiarian is not only drawn to emulsion polymerization but also results spherical fluoropolymer particles.

Further it is noted that Page 9, Lines 30-35, Page 13, Lines 2-6 and Page 27 Lines 19-32 of the present Specification disclose that fluoropolymer solid compositions comprising spherical fluoropolymer fine particles can be prepared from a dispersion obtain by emulsion polymerization. Given that the prior art of record also teaches emulsion polymerization, it is not clear in light of Applicant's own admission why Applicants are arguing that Bekiarian does not teach spherical particles.

19. Applicants cite the *Polymer* article by Gebel but do not state why the reference is being referred to. If Applicants are attempting to show that the presently claimed process w/o drying is

critical, it is significant to note that Doyle discloses a process in which the fluoropolymer may be hydrolyzed by several methods including hydrolysis of the particles in a suspension, i.e. without drying. Further given that Gebel is drawn to a highly swollen membrane, it is not clear how this is applicable to the prior art of record.

### *Conclusion*

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEXANDER C. KOLLIAS whose telephone number is (571)-270-3869. The examiner can normally be reached on Monday-Friday, 8:00 AM -5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Basia Ridley can be reached on (571)-272-1453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. C. K./  
Examiner, Art Unit 1725

/Basia Ridley/  
Supervisory Patent Examiner, Art Unit 1725